CLAIMS

1. A method for identifying closed areas and defining masks in a digital image, comprising the following stages:

- dividing the image into a plurality of points and memorising values representative at least of the relative luminance of each point of the image in an ordered sequence in the memory of an electronic processor,
- memorising values representative of the luminance gradient of each point of the image, determined on the basis of the luminance values of each point and of the surrounding points, in an ordered sequence in the memory of the electronic processor,
- preparing an intermediate threshold value, in order to sub-divide the luminance gradient values into a first and a second group,
- memorising in the memory of the electronic processor an ordered series of values identifying borders, each defined by a cluster of adjacent points whose gradient value belongs to the first group of luminance gradient values,
- selecting closed edges, defined by the borders whose points all have at least two neighbours whose luminance gradient values belong to the first group,
- memorising in the memory of the electronic processor the points of the image that are included within each edge, taken in succession, in order to define masking areas of the digital image corresponding to objects depicted in this image.

2. A method for identifying closed areas and defining masks in a digital image as claimed in claim 1, characterised in that, prior to the stage of selection of the closed edges, it comprises a closure cycle including the stages, repeated one or more times, of:

- identifying the end points of open borders, defined as points of a border that have a single adjacent point whose luminance gradient values belong to the first group,
- selecting, among the points whose luminance gradient values belong to the second group, a cluster of points defining a closure path between the end point of the open border and a point of a border that is not immediately

adjacent,

- identifying the points of the cluster selected during the previous stage as belonging to the same border as the end point,
- updating the ordered series of values identifying the borders.

3. A method for identifying closed areas and defining masks in a digital image as claimed in claim 2, characterised in that in the cycle of closure of open borders, the luminance gradient values of the second group of points belonging to the closure path are converted into a value included in the range of values of the first group.

4. A method for identifying closed areas and defining masks in a digital image as claimed in claim 2, characterised in that in the cycle of closure of open borders, the cluster of points selected in the second group have luminance gradient values differing only slightly from the predetermined threshold value.

5. A method for identifying closed areas and defining masks in a digital image as claimed in claim 2, characterised in that in the cycle of closure of open borders, the choice of the cluster of points selected in the second group depends on a coherence value representative of the degree of regularity of this border.

6. A method for identifying closed areas and defining masks in a digital image as claimed in claim 2, characterised in that the stage of memorisation of the ordered series of values identifying borders comprises the memorisation of the length of these borders, defined as the number of points belonging to the first group that combine to define each border, the distance in points or pixels to which reference is made when searching for another border from the end point of an open border being proportional to the length of the latter to avoid prolonging very short and often incidental border fragments and to promote the closure of borders whose linear extension is of particular significance.

7. A method for identifying closed areas and defining masks in a digital image as claimed in claim 1, characterised in that, following the stage of selection of the

closed edges, it comprises a stage of pruning of the open borders.

8. A method for identifying closed areas and defining masks in a digital image as claimed in claim 7, characterised in that it comprises a stage of identification and memorisation, for each point of the image, of the number of neighbouring points or clusters of points belonging to a border, defined by the points whose luminance gradient value is greater than the predetermined threshold value and in that, in the pruning stage, the value of the number of points or clusters of points neighbouring each point of the border is updated from the end of each open border and proceeding backwards along this border, by decreasing it by one unit until a value is found that, although small, is still greater than unity at the location of a node or point of intersection of a border.

9. A method for identifying closed areas and defining masks in a digital image as claimed in claim 1, characterised in that it comprises a first preliminary stage of acquisition of a colour image by digitisation means functionally connected to the electronic processor, a second preliminary stage of memorisation of a sequence of values representative of colour parameters of points of this image, and a third preliminary stage of conversion of these colour parameter values into equivalent values comprising, for each point of the image, at least one value representative of the luminance of the point.

10. A method for identifying closed areas and defining masks in a digital image as claimed in claim 1, characterised in that the intermediate threshold value is proportional to the mean of the luminance gradient values of all the points of the digital image.

11. A method for identifying closed areas and defining masks in a digital image as claimed in claim 1, characterised in that, following the pruning stage, it comprises a further stage of elimination of lens edges, defined by edges whose ends are closed as eyes and are connected by an intermediate border section.

12. A method for identifying closed areas and defining masks in a digital image

as claimed in claim 11, characterised in that the stage of elimination of the lens edges includes the elimination of the intermediate border section or selectively, as an alternative, the closure of the eye ends by means of an additional border closure section.

13. A method for identifying closed areas and defining masks in a digital image as claimed in claim 1, characterised in that prior to the stage of memorisation of the points of the image that are included within each edge, the closed edges are organised in an ordered sequence, the points of each closed edge then being input into a temporary map in order to identify, by filling the area external thereto, the area inside each edge.

14. A method for identifying closed areas and defining masks in a digital image as claimed in claim 14, characterised in that following the identification of the area inside each edge, the points of these areas are input into a common map in sequence according to the order of the sequential order of the closed edges, checking, for each area, whether one of its points does or does not coincide with a point of an area relating to a prior edge in the sequence, to identify a hierarchical order of closed container-contained areas.

15. A method for identifying closed areas and defining masks in a digital image as claimed in claim 1, characterised in that it comprises at least one interactive modification of the values of points, borders and/or closed areas by a user, carried out by means of inputting means connected to the electronic processor, comprising a stage of display of the borders on video means and including at least one operation selected from the group of operations comprising:

- an operation to open closed edges, by modifying the values stored on the processor and associated with points belonging to a closed edge and identified by the inputting means,
- an operation to close open edges, by modifying the values stored on the processor and associated with points whose luminance gradient values are lower than the predetermined threshold value and that are identified by the user by means of the inputting means,

- an operation to assign a closed area to a group of areas of different hierarchy, by identification by the user, by means of the inputting means, of at least one point of this closed area.